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10/528,108

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EXAMINER

HERRERA, DIEGO D

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/528,108	<b>Applicant(s)</b> ITO ET AL.	
	<b>Examiner</b> Diego Herrera	<b>Art Unit</b> 2617	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 March 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 101***

Claims 13-18, rejection has been withdrawn.

### ***Response to Amendment***

Claims 13-18 have been amended.

### ***Response to Arguments***

Applicant's arguments filed 5/30/2008 have been fully considered but they are not persuasive. In regards to applicant's arguments, claims 1-18 are directed to multiplexed connections of the personal stations and radio cell station apparatus establishing space division multiple access, however these and other limitations in the claims are met by the combination of Doi and Ishida.

Doi and Ishida teach similar methods, systems, and networks where they deal with switching signals by maintaining communication quality. Applicant's arguments state that the references do not teach switching to a SDMA, see ¶¶: 24-26 of Ishida, nevertheless, the combination of these references uses SDMA between the base station of the network and mobile device.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doi (US publication 20020039886), and in view of Ishida (US publication 20010019952).

**Regarding claims 1.** Doi discloses a radio cell station apparatus to which a plurality of personal stations can establish space division multiple access (fig. 8, paragraph [0003], [0026], [0080], [0089], Doi teaches establishing from a mobile device to a radio cell

station to a TDMA/TDD frame and simultaneously provision), said radio cell station apparatus transmitting to and receiving from each of said plurality of personal stations a signal including an already-known reference signal different for each personal station (paragraph [0032], [0058], Doi teaches a reference signal which is a basis for forming the antenna directivity), comprising:

multiplexed connection number detection means for detecting number of multiplexed connections of the personal stations establishing space division multiple access (paragraph [0032], [0085], [0089], Doi teaches the radio base station path division multiplexes a maximum of four signals on the same frequency in addition to TDMA/TDD); and

However, Doi does not disclose specifically reference signal allocation means for allocating, by switching the reference signals that have been allocated to the personal stations establishing space division multiple access respectively prior to change in the number of multiplexed connections to reference signals capable of maintaining communication quality even after the number of multiplexed connections is changed, the switched reference signals to said plurality of personal stations respectively, when change in the number of multiplexed connections is detected in said multiplexed connection number detection means, nevertheless, Ishida teaches reference signal allocation means (fig. 4, paragraph [0078], [0087], [0092]-[0093], Ishida teaches allocation channel assignment notification contains the associated UW and notifies that the link channel has been assigned to the mobile station).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to specifically include reference signal allocation means for allocating, by switching the reference signals that have been allocated to the personal stations establishing space division multiple access respectively prior to change in the number of multiplexed connections to reference signals capable of maintaining communication quality even after the number of multiplexed connections is changed, the switched reference signals to said plurality of personal stations respectively, when change in the number of multiplexed connections is detected in said multiplexed connection number detection means as taught by Ishida for the purposes of controlling unit updates and to transmit a channel assignment notification that specifies time slot and frequency and assigned channel.

**Consider claims 4.** Doi discloses a personal station establishing space division multiple access to a radio cell station apparatus (paragraph [0025], Doi teaches the disclosure that of a radio communication system and mobile devices), said personal station transmitting to and receiving from said radio cell station apparatus a signal including an already-known reference signal different for each personal station (paragraph [0026], Doi teaches the mobile device communicating with radio base station), comprising:

means for receiving a request for switching a reference signal from said radio cell station apparatus in accordance with change in the number of multiplexed connections of the personal stations establishing space division multiple access (abstract, paragraph [0029], [0058], [0066], [0093], and [0094], Doi teaches reference signal being received

by antenna of base station and establishing division multiple access); and

However, Doi does not disclose specifically reference signal allocation means for allocating, by switching the reference signals that have been allocated to the personal stations establishing space division multiple access respectively prior to change in the number of multiplexed connections to reference signals capable of maintaining communication quality even after the number of multiplexed connections is changed, the switched reference signals to said plurality of personal stations respectively, when change in the number of multiplexed connections is detected in said multiplexed connection number detection means, nevertheless, Ishida teaches reference signal allocation means (fig. 4, paragraph [0078], [0087], [0092]-[0093], Ishida teaches allocation channel assignment notification contains the associated UW and notifies that the link channel has been assigned to the mobile station).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to specifically include reference signal allocation means for allocating, by switching the reference signals that have been allocated to the personal stations establishing space division multiple access respectively prior to change in the number of multiplexed connections to reference signals capable of maintaining communication quality even after the number of multiplexed connections is changed, the switched reference signals to said plurality of personal stations respectively, when change in the number of multiplexed connections is detected in said multiplexed connection number detection means as taught by Ishida for the purposes of controlling

unit updates and to transmit a channel assignment notification that specifies time slot and frequency and assigned channel.

**Regarding claim 7.** Doi discloses a method of controlling a reference signal performed by a radio cell station apparatus to which a plurality of personal stations can establish space division multiple access (fig. 8, paragraph [0003], [0026], [0080], [0089], Doi teaches establishing from a mobile device to a radio cell station to a TDMA/TDD frame and simultaneously provision), said radio cell station apparatus transmitting to and receiving from each of said plurality of personal stations a signal including an already-known reference signal different for each personal station (paragraph [0032], [0058], Doi teaches a reference signal which is a basis for forming the antenna directivity), comprising the steps of:

detecting number of multiplexed connections of the personal stations establishing space division multiple access (paragraph [0032], [0085], [0089], Doi teaches the radio base station path division multiplexes a maximum of four signals on the same frequency in addition to TDMA/TDD); and

However, Doi does not disclose specifically reference signal allocation\_means for allocating, by switching the reference signals that have been allocated to the personal stations establishing space division multiple access respectively prior to change in the number of multiplexed connections to reference signals capable of maintaining communication quality even after the number of multiplexed connections is changed, the switched reference signals to said plurality of personal stations respectively, when change in the number of multiplexed connections is detected in said multiplexed



connection number detection means, nevertheless, Ishida teaches reference signal allocation means (fig. 4, paragraph [0078], [0087], [0092]-[0093], Ishida teaches allocation channel assignment notification contains the associated UW and notifies that the link channel has been assigned to the mobile station).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to specifically include reference signal allocation means for allocating, by switching the reference signals that have been allocated to the personal stations establishing space division multiple access respectively prior to change in the number of multiplexed connections to reference signals capable of maintaining communication quality even after the number of multiplexed connections is changed, the switched reference signals to said plurality of personal stations respectively, when change in the number of multiplexed connections is detected in said multiplexed connection number detection means as taught by Ishida for the purposes of controlling unit updates and to transmit a channel assignment notification that specifies time slot and frequency and assigned channel.

**Regarding claim 10.** Doi discloses a method of controlling a reference signal performed by a personal station establishing space division multiple access to a radio cell station apparatus (paragraph [0025], Doi teaches the disclosure that of a radio communication system and mobile devices), said personal station transmitting to and receiving from said radio cell station apparatus a signal including an already-known reference signal different for each personal station (paragraph [0026], Doi teaches the mobile device communicating with radio base station), comprising the steps of:

receiving a request for switching a reference signal from said radio cell station apparatus in accordance with change in the number of multiplexed connections of the personal stations establishing space division multiple access (abstract, paragraph [0029], [0058], [0066], [0093], and [0094], Doi teaches reference signal being received by antenna of base station and establishing division multiple access); and

However, Doi does not disclose specifically reference signal allocation means for allocating, by switching the reference signals that have been allocated to the personal stations establishing space division multiple access respectively prior to change in the number of multiplexed connections to reference signals capable of maintaining communication quality even after the number of multiplexed connections is changed, the switched reference signals to said plurality of personal stations respectively, when change in the number of multiplexed connections is detected in said multiplexed connection number detection means, nevertheless, Ishida teaches reference signal allocation means (fig. 4, paragraph [0078], [0087], [0092]-[0093], Ishida teaches allocation channel assignment notification contains the associated UW and notifies that the link channel has been assigned to the mobile station).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to specifically include reference signal allocation means for allocating, by switching the reference signals that have been allocated to the personal stations establishing space division multiple access respectively prior to change in the number of multiplexed connections to reference signals capable of maintaining communication quality even after the number of multiplexed connections is changed,

the switched reference signals to said plurality of personal stations respectively, when change in the number of multiplexed connections is detected in said multiplexed connection number detection means as taught by Ishida for the purposes of controlling unit updates and to transmit a channel assignment notification that specifies time slot and frequency and assigned channel.

**Regarding claim 13.** Doi discloses a computer program embodied in a computer readable medium, for controlling a reference signal performed by a radio cell station apparatus to which a plurality of personal stations can establish space division multiple access (fig. 8, paragraph [0003], [0026], [0080], [0089], Doi teaches establishing from a mobile device to a radio cell station to a TDMA/TDD frame and simultaneously provision), said radio cell station apparatus transmitting to and receiving from each of said plurality of personal stations a signal including an already-known reference signal different for each personal station (paragraph [0032], [0058], Doi teaches a reference signal which is a basis for forming the antenna directivity), causing a computer to execute the steps of:

detecting number of multiplexed connections of the personal stations establishing space division multiple access (paragraph [0032], [0085], [0089], Doi teaches the radio base station path division multiplexes a maximum of four signals on the same frequency in addition to TDMA/TDD); and

However, Doi does not disclose specifically reference signal allocation means for allocating, by switching the reference signals that have been allocated to the personal stations establishing space division multiple access respectively prior to change in the

number of multiplexed connections to reference signals capable of maintaining communication quality even after the number of multiplexed connections is changed, the switched reference signals to said plurality of personal stations respectively, when change in the number of multiplexed connections is detected in said multiplexed connection number detection means, nevertheless, Ishida teaches reference signal allocation means (fig. 4, paragraph [0078], [0087], [0092]-[0093], Ishida teaches allocation channel assignment notification contains the associated UW and notifies that the link channel has been assigned to the mobile station).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to specifically include reference signal allocation means for allocating, by switching the reference signals that have been allocated to the personal stations establishing space division multiple access respectively prior to change in the number of multiplexed connections to reference signals capable of maintaining communication quality even after the number of multiplexed connections is changed, the switched reference signals to said plurality of personal stations respectively, when change in the number of multiplexed connections is detected in said multiplexed connection number detection means as taught by Ishida for the purposes of controlling unit updates and to transmit a channel assignment notification that specifies time slot and frequency and assigned channel.

**Regarding claim 16.** Doi discloses a computer program embodied in a computer readable medium, for controlling a reference signal performed by a personal station establishing space division multiple access to a radio cell station apparatus (fig. 8,

paragraph [0003], [0026], [0080], [0089], Doi teaches establishing from a mobile device to a radio cell station to a TDMA/TDD frame and simultaneously provision), said personal station transmitting to and receiving from said radio cell station apparatus a signal including an already-known reference signal different for each personal station (paragraph [0026], Doi teaches the mobile device communicating with radio base station), causing a computer to execute the steps of:

receiving a request for switching a reference signal from said radio cell station apparatus in accordance with change in the number of multiplexed connections of the personal stations establishing space division multiple access (abstract, paragraph [0029], [0058], [0066], [0093], and [0094], Doi teaches reference signal being received by antenna of base station and establishing division multiple access); and

However, Doi does not disclose specifically reference signal allocation\_means for allocating, by switching the reference signals that have been allocated to the personal stations establishing space division multiple access respectively prior to change in the number of multiplexed connections to reference signals capable of maintaining communication quality even after the number of multiplexed connections is changed, the switched reference signals to said plurality of personal stations respectively, when change in the number of multiplexed connections is detected in said multiplexed connection number detection means, nevertheless, Ishida teaches reference signal allocation means (fig. 4, paragraph [0078], [0087], [0092]-[0093], Ishida teaches allocation channel assignment notification contains the associated UW and notifies that the link channel has been assigned to the mobile station).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to specifically include reference signal allocation means for allocating, by switching the reference signals that have been allocated to the personal stations establishing space division multiple access respectively prior to change in the number of multiplexed connections to reference signals capable of maintaining communication quality even after the number of multiplexed connections is changed, the switched reference signals to said plurality of personal stations respectively, when change in the number of multiplexed connections is detected in said multiplexed connection number detection means as taught by Ishida for the purposes of controlling unit updates and to transmit a channel assignment notification that specifies time slot and frequency and assigned channel.

**Consider claim 2.** The radio cell station apparatus according to claim 1, the combination discloses further comprising storage means for storing a reference signal optimized for each number of multiplexed connections of the personal stations establishing space division multiple access (paragraph [0025]-[0027], Doi teaches communication between base station and mobile device or apparatus, ¶: 4-6, 24, Ishida teaches SDM communication), wherein when the number of multiplexed connections of the personal stations establishing space division multiple access is changed, said reference signal allocation means selects reference signals optimal for the changed number of multiplexed connections from said storage means and allocates the selected reference signals to said plurality of personal stations respectively (paragraph [0025]-[0028], and [0032], Doi teaches radio

information calculating data for controlling antenna directivity and reception unit forming and using calculating data).

**Consider claim 3.** The radio cell station apparatus according to claim 2, Doi discloses wherein said reference signal stored in said storage means is calculated for each number of multiplexed connections based on a high autocorrelation characteristic and a low cross-correlation characteristic (paragraph [0056], [0058], Doi teaches the storing reference signal).

**Consider claim 5.** The personal station according to claim 4, The combination discloses further comprising storage means for storing a reference signal optimized (paragraph [0056], [0058], Doi teaches the storing reference signal) for each number of multiplexed connections of the personal stations establishing space division multiple access (paragraph [0025]-[0027], Doi teaches communication between base station and mobile device or apparatus, ¶: 4-6, 24, Ishida teaches SDM communication), wherein when the request for switching the reference signal is received from said radio cell station apparatus, a reference signal optimal for the changed number of multiplexed connections is selected from said storage means and a response to the request for switching including the selected reference signal is transmitted to said radio cell station apparatus (fig. 4, paragraph [0078], [0087], [0092]-[0093], Ishida teaches allocation channel assignment notification contains the associated UW and notifies that the link channel has been assigned to the mobile station, ¶: 4-6, 24, Ishida teaches SDM communication).

**Consider claim 6.** The personal station according to claim 5, The combination

discloses wherein said reference signal stored in said storage means is calculated for each number of multiplexed connections based on a high autocorrelation characteristic and a low cross-correlation characteristic (paragraph [0025]-[0028], and [0032], Doi teaches radio information calculating data for controlling antenna directivity and reception unit forming and using calculating data).

**Consider claim 8.** The method of controlling a reference signal according to claim 7, the combination discloses further comprising the step of storing a reference signal optimized for each number of multiplexed connections of the personal stations establishing space division multiple access (paragraph [0032], [0085], [0089], Doi teaches the radio base station path division multiplexes a maximum of four signals on the same frequency in addition to TDMA/TDD), wherein when the number of multiplexed connections of the personal stations establishing space division multiple access is changed, reference signals optimal for the changed number of multiplexed connections that have been stored are selected and the selected reference signals are allocated to said plurality of personal stations respectively (paragraph [0025]-[0028], and [0032], Doi teaches radio information calculating data for controlling antenna directivity and reception unit forming and using calculating data).

**Consider claims 9.** The method of controlling a reference signal according to claims 8, the combination discloses wherein the step of storing a reference signal optimized (paragraph [0056], [0058], Doi teaches the storing reference signal) for each number of multiplexed connections of the personal stations establishing space division multiple access further includes the step of calculating a reference signal for each number of



multiplexed connections based on a high autocorrelation characteristic and a low cross-correlation characteristic (paragraph [0032], [0085], [0089], Doi teaches the radio base station path division multiplexes a maximum of four signals on the same frequency in addition to TDMA/TDD).

**Consider claim 11.** The method of controlling a reference signal according to claim 10, the combination discloses further comprising the step of storing a reference signal optimized (paragraph [0056], [0058], Doi teaches the storing reference signal) for each number of multiplexed connections of the personal stations establishing space division multiple access (paragraph [0025]-[0027], Doi teaches communication between base station and mobile device or apparatus, ¶: 4-6, 24, Ishida teaches SDM communication), wherein when the request for switching the reference signal is received from said radio cell station apparatus, a reference signal optimal for the changed number of multiplexed connections that has been stored is selected and a response to the request for switching including the selected reference signal is transmitted to said radio cell station apparatus (fig. 4, paragraph [0078], [0087], [0092]-[0093], Ishida teaches allocation channel assignment notification contains the associated UW and notifies that the link channel has been assigned to the mobile station).

**Consider claim 12.** The method of controlling a reference signal according to claim 11, the combination discloses wherein the step of storing a reference signal optimized for each number of multiplexed connections of the personal stations (paragraph [0056], [0058], Doi teaches the storing reference signal) establishing space division multiple

access further includes the step of calculating a reference signal for each number of multiplexed connections based on a high autocorrelation characteristic and a low cross-correlation characteristic (paragraph [0032], [0085], [0089], Doi teaches the radio base station path division multiplexes a maximum of four signals on the same frequency in addition to TDMA/TDD).

**Consider claim 14.** The computer program embodied in a computer readable medium, for controlling a reference signal according to claim 13, the combination discloses further causing the computer to execute the step of storing a reference signal optimized for each number of multiplexed connections of the personal stations establishing space division multiple access (paragraph [0025]-[0027], Doi teaches communication between base station and mobile device or apparatus, ¶: 4-6, 24, Ishida teaches SDM communication), wherein when the number of multiplexed connections of the personal stations establishing space division multiple access is changed, reference signals optimal for the changed number of multiplexed connections that have been stored are selected and the selected reference signals are allocated to said plurality of personal stations respectively (paragraph [0025]-[0028], and [0032], Doi teaches radio information calculating data for controlling antenna directivity and reception unit forming and using calculating data).

**Consider claim 15.** The computer program embodied in a computer readable medium, for controlling a reference signal according to claim 14, the combination discloses wherein the step of storing a reference signal optimized for each number of multiplexed connections of the personal stations (paragraph [0056], [0058], Doi teaches the storing

reference signal, ¶: 4-6, 24, Ishida teaches SDM communication) establishing space division multiple access further causes the computer to execute the step of calculating a reference signal for each number of multiplexed connections based on a high autocorrelation characteristic and a low cross-correlation characteristic (paragraph [0032], [0085], [0089], Doi teaches the radio base station path division multiplexes a maximum of four signals on the same frequency in addition to TDMA/TDD).

**Consider claim 17.** The computer program embodied in a computer readable medium, for controlling a reference signal according to claim 16, the combination discloses further causing the computer to execute the step of storing a reference signal optimized (paragraph [0056], [0058], Doi teaches the storing reference signal) for each number of multiplexed connections of the personal stations establishing space division multiple access (paragraph [0025]-[0027], Doi teaches communication between base station and mobile device or apparatus, ¶: 4-6, 24, Ishida teaches SDM communication), wherein when the request for switching the reference signal is received from said radio cell station apparatus, a reference signal optimal for the changed number of multiplexed connections that has been stored is selected and a response to the request for switching including the selected reference signal is transmitted to said radio cell station apparatus (fig. 4, paragraph [0078], [0087], [0092]-[0093], Ishida teaches allocation channel assignment notification contains the associated UW and notifies that the link channel has been assigned to the mobile station).

**Consider claim 18.** The computer program embodied in a computer readable medium, for controlling a reference signal according to claim 17, the combination discloses

wherein the step of storing a reference signal optimized for each number of multiplexed connections of the personal stations (paragraph [0056], [0058], Doi teaches the storing reference signal) establishing space division multiple access (¶: 4-6, 24, Ishida teaches SDM communication) further causes the computer to execute the step of calculating a reference signal for each number of multiplexed connections based on a high autocorrelation characteristic and a low cross-correlation characteristic (paragraph [0032], [0085], [0089], Doi teaches the radio base station path division multiplexes a maximum of four signals on the same frequency in addition to TDMA/TDD).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Diego Herrera whose telephone number is (571) 272-0907. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lester Kincaid can be reached on (571) 272-7922. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Diego Herrera  
Patent Examiner

/Lester Kincaid/  
Supervisory Patent Examiner, Art Unit 2617